CAAM 335 · MATRIX ANALYSIS

Spring 2013 · Rice University

Lectures:	Section 1 (Carden): MWF 9:00AM, Duncan Hall 1064 Section 2 (Yin): MWF 2:00PM, Duncan Hall 1070
Web Site:	http://www.caam.rice.edu/∼caam335
Instructors:	Russell Carden (carden @ rice.edu), Duncan Hall 3023, (713) 348–6113 Office Hours: Thursdays 2–4 PM, or by appointment Wotao Yin (wotao.yin @ rice.edu), Duncan Hall 3086, (713) 348–5368 Office Hours: Wednesday 10 AM – 12 PM, or by appointment
Recitations:	Wednesdays 6:45 PM - 8 PM, Brockman Hall 101
Teaching Assistant:	Reid Atcheson (tra2 @ rice.edu), Duncan Hall Duncan Hall 2033 Office hours: Wednesday 3 PM – 5 PM Yangyang Xu (yx9 @ rice.edu), Duncan Hall Duncan Hall 2107 Office hours: Mondays and Fridays 1 PM - 2 PM
Physical Laboratory:	The lectures will be accompanied by an *optional* 1-credit laboratory in which students examine concepts from the course more deeply in the context of physical experiments. An interest meeting will be held Wednesday January 9, at 6:00 pm, in Duncan Hall 2014. Lab TA: TBD (TBD @ rice.edu), Duncan Hall ****
Prerequisites:	MATH 212 and CAAM 210 Less formally: you should be familiar with multivariable calculus and elementary matrix manipulations (matrix addition and multiplication, Gaussian elimination), and be able to write MATLAB programs.
Grading:	40% problem sets, 60% exams. (Class participation and improving performance on the exams will be considered when assigning borderline grades.)
Problem Sets:	Problem sets will be assigned roughly once a week. You may collaborate on the problems, but your write-ups must be your own independent work. Transcribed solutions are unacceptable. *You may not consult solutions from previous sections of this class.* Papers on each set will be randomly distributed to individual graders to average out variability in grading.
Late Policy:	You may turn in two problem sets one class period late without penalty. Subsequent late assignments will be penalized 20% each. Homework will not be accepted more than one class period late without a written excuse. You may not use two 'lates' on one assignment.
Exams:	Three take-home, timed, closed-book exams will each account for 20% of the final grade. Each exam must be your individual, unassisted effort; indicate compliance by writing out in full and signing the traditional pledge. Late exams will not be accepted without a written excuse. Approximate exam dates are given on the reverse.
Course Notes:	*Matrix Analysis* by Steve Cox (available as a course pack from the campus store, and as a PDF file from the course web site). You may also view a version of the notes via Connexions: `http://cnx.rice.edu`. *Supplemental Notes* by Matthias Heinkenschloss are available from the course website.
Recommended Reading:	Carl Meyer, *Applied Matrix Analysis and Linear Algebra* Gilbert Strang, *Linear Algebra and Its Applications*, 3rd ed. Gilbert Strang, *Introduction to Applied Mathematics* Lars Ahlfors, *Complex Analysis*, 3rd ed. R. V. Churchill, & J. W. Brown, *Complex Variables and Applications*, 5th ed. D. J. Higham & N. J. Higham, *MATLAB Guide*
Programming:	Most homework assignments will require some MATLAB programming. Your solutions should adhere to good programming standards, and must not be copied from other students. Consult the course web site for pointers to MATLAB tutorials.

Any student with a disability requiring accommodation in this course is encouraged to contact the instructor during the first week of class, and also to contact Disability Support Services in the Ley Student Center.

CAAM 335 · Course Outline

1. Matrix Methods for Electrical Systems
2. Matrix Methods for Mechanical Systems
3. The Column and Null Spaces
4. The Fundamental Theorem of Linear Algebra
5. Least Squares
6. Symmetric Eigenvalue Problems
7. The Singular Value Decomposition (SVD)
8. Matrix Methods for Dynamical Systems
9. The Laplace Transform
10. Complex Numbers and Functions
11. Complex Integration
12. The Spectral Representation

Tentative Exam Schedule

There will be three timed (three hour), closed-book, take-home exams.
You will have at least a four day window in which to take each exam.

Exam 1, Lectures 1–15: posted 2/11, due 2/15

Exam 2, Lectures 16–26: posted 3/25, due 3/27

Exam 3, Lectures 27–40: posted 4/19, due 5/1